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THE EFFECT ON THE GROWTH RATE OF TURKEYS OF 2-AMINO-5-NITROTHIAZOLE IN THE TREATMENT OF HISTOMONIASIS

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INTRODUCTION

The histomonicidal properties of a number of thiazole compounds were investigated by Waletzky, Clark & Marson (1950) and it was found that the most active of the series was 2-amino-5-nitrothiazole. The therapeutic effects of this compound have since been verified on several occasions, but little information is available concerning its toxicity for turkeys. Seeger, Lucas & Tomhave (1950), however, reported that the average weight of turkeys was suppressed when the drug was incorporated in the food, while De Volt, Holst & Tromba (1951) found that food consumption and growth appeared to be slightly depressed in those turkeys receiving 0·1 per cent. of the drug in the food. Grumbles, Boney & Turk (1952a, b) were unable to confirm the weight-depressing effects, but they did obtain evidence that egg-production and fertility were significantly reduced by the addition of 0·1 per cent. of the compound to the food. More recently Hudson & Pino (1952) reported that this concentration rendered young cockerels infertile.

The drug is now being widely used in the control of histomoniasis and so far no reports of toxicity resulting from its use under field conditions have been received. Nevertheless, it seems important to establish the relationship between therapeutic and toxic dosages, and to study in more detail the effect of the drug on growth rate and food consumption. This information is also required as a preliminary to a study of the therapy of histomonas infections in turkeys.

METHODS

The poults used in these experiments were all from the same American bronze stock. They were received in the laboratory when two or three days old and kept in heated hovers on wire floors. At approximately six weeks of age they were transferred to pens on sawdust floors. Artificial lighting was not provided.

The birds were given unlimited water and a standard chick meal to which the different concentrations of drug were added. With the exception of Experiment 1, where the drug was previously mixed with an inert vehicle, a pure sample of 2-amino-5-nitrothiazole (ANT) was used. The compound is only slightly soluble in water, and where measured doses were given it was suspended in 4 per cent. gum acacia in physiological saline.

1. *The Administration of Different Concentrations of 2-amino-5-nitrothiazole in the food*

Four groups of six poults were given varying concentrations of ANT in the food. The birds were weighed separately at intervals and the weight of food which they consumed was recorded over a period of 17 days. The average weights of the poults in each group are plotted against time in Fig. 1 (over-leaf) and other details are recorded in Table I. An analysis of variance with covariance adjustment for initial weight was applied to the final weights of the birds and the differences between the group means were found to be significant ($P < 0.01$).

It is evident that the weight increase of those birds receiving 0·1 and 0·2 per cent. of the drug in the food was retarded while those receiving 0·4 per cent. rapidly lost weight.

At the end of the experiment one of the group receiving the highest concentration of drug died. There were no well-defined *post-mortem* lesions although a slight enteritis was present. All the birds of this group showed severe wasting, with weakness of the legs and in two cases slight asymmetrical contraction of the neck muscles. By the end of the experiment these symptoms were beginning to appear in those birds receiving 0·2 per cent. of the drug in the food. The brains and spinal cords of some of these birds were examined by L. M. Markson, of the Pathology Department at Weybridge, and he was unable to find any pathological changes.

TABLE I

THE EFFECT OF VARYING CONCENTRATIONS OF 2-AMINO-5-NITROTHIAZOLE IN THE FOOD

Concentration ANT in food, per cent. w./w.	Number of poults	Weight of food consumed, kg.	Weight of drug consumed, grammes	Increase in weight of poults, per cent.
0	6	28·6	0	29·0
0·1	6	24·0	24·0	12·5
0·2	6	22·7	45·4	17·5
0·4	6	8·5	34·0	−27·2

2. *Administration of 2-amino-5-nitrothiazole by different methods*

A possible explanation of the growth-retarding effects is that the presence of the drug rendered the food unpalatable and as a consequence food consumption was reduced. To test this theory 24 poults were randomised into four groups. The first group of poults (A) were given 0·1 per cent. of pure ANT in the diet. The amount of food containing the drug was weighed each day and the amount of drug consumed per 100 grammes bodyweight was calculated. An equivalent amount of the drug suspended in 4 per cent. gum acacia was administered to the second group of poults (B) by means of a rubber oesophageal cannula, the dose being divided into two equal portions given in the morning and evening of each day. The two groups of birds thus received the same amount of drug orally, but in only one group was it incorporated in the food. Two control groups were included in the experiment; one (C) received the normal diet and the other (D) also received the normal diet, but in addition was given by

Table II

The Effect of 0·1 per cent. 2-Amino-5-Nitrothiazole in the Diet and an Equivalent Amount Administered by Oesophageal Cannula

Group	Treatment	Mean initial weight, grammes	Mean weight increase in 16 days, grammes	Total food consumed, kg.	Average consumption of drug, mg. per 100 grammes b.w. per day
A	0·1 per cent. ANT in diet	204	88	3·06	11·4
B	ANT in gum solution	206	123	3·60	11·4
C	Normal diet only	199	218	3·54	0
D	Gum solution control	202	226	4·25	0

means of the cannula the same volume of gum acacia solution as the second group (B).

The average bodyweights of the four groups are recorded in Fig. 2 and it is evident that after 14 days the weights of both groups of poults receiving the drug increased more slowly than the control groups. Furthermore, the inhibition was apparent when the birds were weighed on the first occasion after receiving the drug. From the other details which are recorded in Table II it will be seen that the food consumption of those birds receiving the drug mixed in the food was lower than the other groups including the group receiving the drug directly into their crops.

3. *The Effect of 0·05 per cent. 2-amino-5-nitrothiazole*

Another experiment identical in plan to that described above was carried out using 0·05 per cent. of the drug mixed in the food. The average daily consumption of the drug was 6·6 mg. per 100 grammes b.w. After 18 days

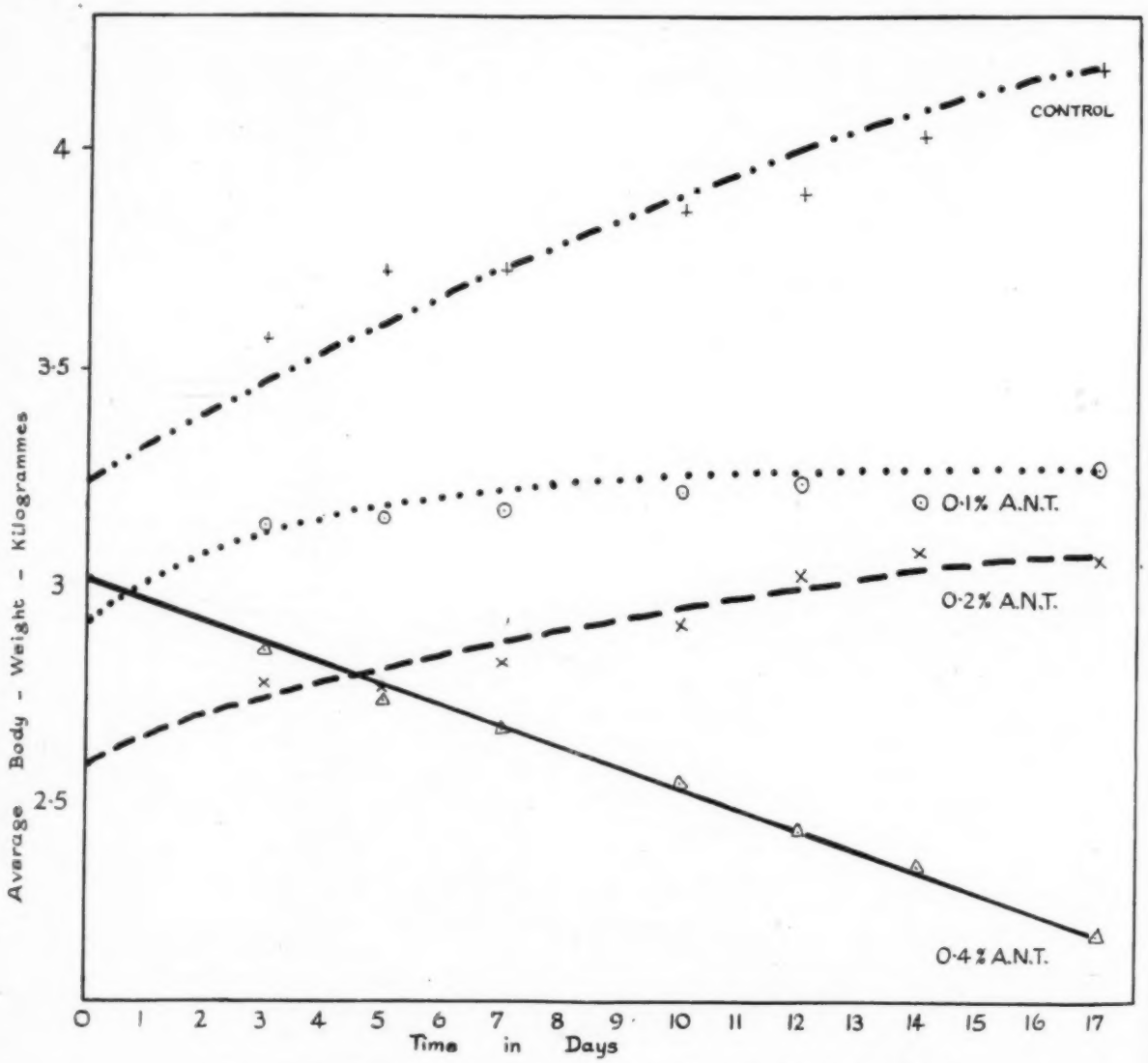

Fig. 1.—The effect of varying concentrations of 2-amino-5-nitrothiazole in the food.

no significant differences between the weights of the birds receiving the different treatments could be demonstrated.

In a further experiment in which turkey poults were given 0·05 per cent. of the drug in the food for three months, no significant differences could be detected between the bodyweights and the food consumption of the treated and control groups.

4. *After-effects of the Administration of 2-amino-5-nitrothiazole*

Seven poults were given dry mash containing 0·1 per cent. ANT for 16 days and an equal number of controls were fed on normal diet. Both groups of poults were then given normal food for a further 19 days at the end of which time they were again weighed.

From the results recorded in Table III it is evident that during the period of administration of the drug the weight increase of the birds was significantly retarded, and during the period when normal food was given the gain in weight of those poults, which had received the drug, was lower than that of the group receiving the normal food throughout. When a covariance adjustment was made for bodyweight at the end of the first 16 days, the latter difference was not significant. Similarly, when the weight increases are expressed as percentages of the bodyweight at the beginning of the period on normal diet, the difference is also not significant. There is thus no evidence that the effect of the drug on the growth rate persists after it is removed from the diet.

TABLE III

THE AFTER-EFFECTS OF 2-AMINO-5-NITROTHIAZOLE

Treatment	Average initial weight, grammes	Average weight after 16 days, grammes	Average increase in weight after further 19 days on normal food, grammes	Average final weight, grammes
Control—normal food throughout	200·7	414·0	489·0 (110·8 per cent.)	903·0
0·1 per cent. ANT for first 16 days, normal diet for further 19 days	210·7	325·0	427·7 (131·6 per cent.)	753·5

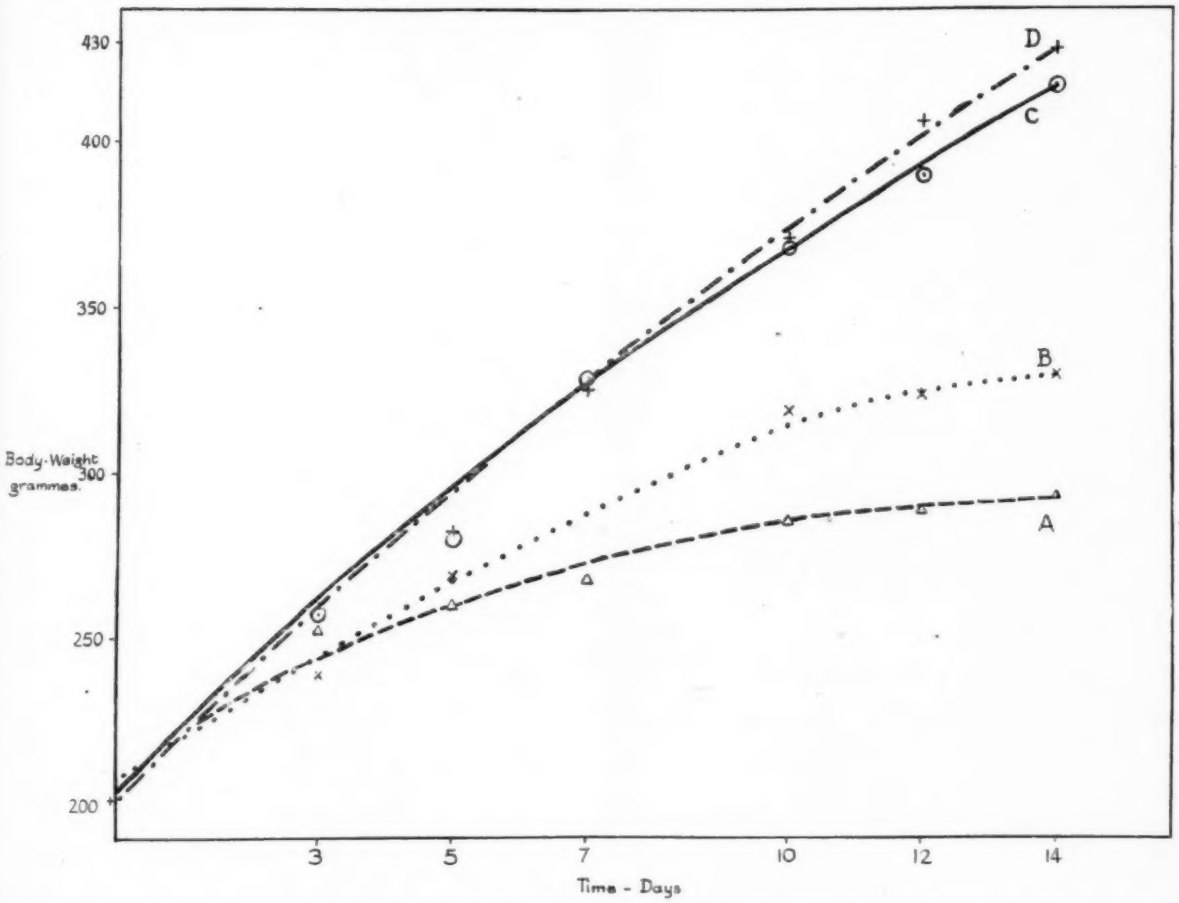

FIG. 2.—The effect of 0·1 per cent. 2-amino-5-nitrothiazole in the diet and an equivalent amount administered by oesophageal cannula.

A. 0·1 per cent. ANT in diet.
B. ANT in gum acacia by cannula.
C. Normal diet only.
D. Gum acacia only.

5-Acute Toxicity

Single doses of pure ANT were administered by oesophageal cannula to turkeys weighing 500 to 1,000 grammes There was no attempt to set up balanced toxicity tests, but the following observations were made:—

Twenty mg. per 100 grammes b.w. had no effect.

Doses of 50 mg. and 100 mg. per 100 grammes b.w. produced in all birds temporary depression with drooping head and wings and loss of appetite. Recovery usually took place after 24 to 48 hours, but in some cases rapid collapse occurred four to seven days after administration of the drug. Sections of tissues fixed immediately after death showed slight vacuolations of the liver cells with some deposition of fat especially in the vicinity of the blood vessels, while in the kidneys there was acute nephritis with degenerative changes in both the glomeruli and tubules.

Two hundred mg. per 100 grammes b.w. killed all the birds within 24 hours. *Post-mortem* examinations showed inflammation of the small intestine with an accumulation of yellow mucus; the liver was dark in colour while the kidneys were pale with distended yellow ureters.

Discussion

The drug, 2-amino-5-nitrothiazole, is widely and successfully used for the protecion of turkeys against histomoniasis, The dosage recommended for continuous prophylaxis is 0·05 per cent. in the mash and, so far, no toxic effects have been attributed to its administration. In the present experiments the longest period during which the birds were receiving this dosage of the drug was three months, but in view of the findings of Hudson & Pino (1952) it would seem advisable to extend this period in order to include observations on the fertility of turkeys reared on food containing the drug before making a final judgment.

The dosage usually recommended for the treatment of established infections in turkeys is 0·1 per cent. of the drug in the mash for 14 to 16 days. In the present series of experiments it has been shown that the toxic effects of this amount of drug could be detected in the weight curves soon after the commencement of therapy. There was no evidence that the growth-suppressing effects of the drug persisted after its removal from the diet, but when normal food was restored the turkeys failed to regain the normal bodyweight for their age. Although the difference between the weights of the two groups of turkeys after 19 days on normal diet was significant, by the time they reached maturity this difference, even if it persisted, would represent only a very small proportion of their final bodyweight. The toxic effects of this dosage are therefore unlikely to be serious provided its administration is not prolonged.

When 0·1 per cent. was incorporated in the food, the average daily consumption of ANT was 11·4 mg. per 100 grammes b.w.; the lowest single dose which caused toxic changes was 50 mg. per 100 grammes b.w., and therefore during a 14-day course of treatment turkeys consume approximately three times this amount.

From the data recorded in Table II it may be concluded that the growth-inhibiting effects cannot be entirely accounted for by an unpleasant taste for the turkeys. The pathological changes following the administration of single doses of ANT suggest that the greatest effect is upon the excretory system, but before the pharmacology of the compound could be studied in any detail, a method for the estimation of the drug in tissues and body fluids would be necessary. With this in view several attempts were made to diazotise the compound by the conventional methods, without success. The absorption spectrum in the visual and ultra-violet wavelengths in acid solution was examined by A. B. Paterson, of the Biochemistry Department at Weybridge, but no absorption bands suitable for estimations were detected.

In assessing the practical application of these experiments it should be noted that where the amount of herbage is limited or the turkeys are raised off the ground and no food is available other than that containing the drug, the conditions correspond to those under which these experiments have been carried out. Where the birds have access to additional food, the amount of drug consumed would be correspondingly less. The toxic effects would be less acute but further experiments are necessary before the reduction of therapeutic efficiency could be assessed.

Most workers are agreed and work in these laboratories amply confirms that 2-amino-5-nitrothiazole is of great value in the control of histomoniasis. The slight toxic effects of therapeutic dosage are unlikely to be serious unless continued for long periods, but 0·1 per cent. of the drug in the food should not be administered for periods longer than necessary for the control of the disease. There is no evidence to suggest that 0·05 per cent. produces any toxic changes but the safety margin between therapeutic and toxic dosage is small and any turkeys which are receiving the drug should be carefully supervised.

Summary

1. Varying amounts of 2-amino-5-nitrothiazole were added to the diet of young turkeys. The weight increase of the poults receiving 0·1 and 0·2 per cent. was significantly reduced, while those receiving 0·4 per cent. lost weight. With increasing amounts of drug the food consumption was correspondingly reduced.

2. The growth-retarding effects could not be accounted for by a lack of palatability.

3. No toxic effects could be demonstrated when 0·05 per cent., the prophylactic dosage of the drug usually recommended, was incorporated in the food for three months.

4. When poults whose growth had been reduced by the drug were given normal diet, their percentage weight increase was comparable with that of poults of the same age receiving normal food throughout, although the difference between the weights of the two groups persisted for at least 18 days.

5. The maximum tolerated oral dose was 20 mg. per 100 grammes b.w. Single doses of 50 and 100 mg. per 100 grammes b.w. killed a proportion of the birds within four to seven days. Degeneration of the kidneys was the main pathological change.

Acknowledgments.—The sample of pure 2-amino-5-nitrothiazole used in these experiments was the gift of Messrs. May & Baker, Ltd.

Grateful acknowledgment is made to Dr. E. L. Taylor for his interest and help.

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STUDIES ON ETHIDIUM BROMIDE

II.—The Treatment of Early *T. congolense* Infections in Cattle

BY

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Introduction

The activity of ethidium bromide (2:7 diamino-9-phenyl-10-ethyl-phenanthridinium bromide) against trypanosome infections in mice was first described by Watkins & Woolfe (1952). Wilde & Robson (1953) reported the activity of the drug against *T. congolense* infections of Zebu cattle in Tanganyika, and Wilson & Fairclough (1953) described the treatment of *T. congolense* infections in cattle at Kabete, Kenya. It was felt desirable to have information on the use of ethidium in as many African territories as possible and so the experiment to be described here was arranged to take place in the Sudan.

Methods and Results

The technique was similar to that used in a previously reported experiment on the therapy of *T. vivax* infection (Ford, Wilmshurst & Karib, 1953). In broad outline the procedure was as follows. A group of 42 one-and-a-half- to two-year-old bulls from the Northern Sudan were vaccinated against bovine pleuro-pneumonia and rinderpest and tethered in shaded compounds. After preliminary examination of wet blood smears to ensure freedom from previous trypanosome infection, each animal was given a subcutaneous injection of 5 c.c. of citrated blood from a natural case of *T. congolense* infection from the Malakal district. The rise of infection was followed by daily wet blood smears and when all the animals were showing trypanosomes they were divided into six groups of seven and treated at the following levels—Group I at 0·125, Group II at 0·25, Group III at 0·5, Group IV at 1·0, Group V at 1·5 mg. per kg. ethidium bromide and there was one group of untreated controls, namely, Group VI. To check on the possibility of cross infections caused by biting flies, two untreated uninfected bulls were tethered alongside the infected controls in a separate compound from the treated groups.

The drug in a 1 per cent. aqueous solution was administered subcutaneously on the side of the thorax behind the scapula. The area was massaged to disperse the drug in the subcutaneous tissues. In all cases there was some tissue reaction varying from a small area of subcutaneous thickening at the low dose levels to a flat plaque-like swelling up to 7 inches across at the highest dose levels. In a small number of cases there was an area of skin necrosis at the injection site. With the passage of time the swellings gradually subsided and the skin wounds healed. At the end of the 16-week observation period there were skin scars varying from 1 inch to 4 inch diameter in two animals in Group V, one in Group IV, one in Group III and one in Group II. One animal in Group V had a persistent soft swelling about 2 inches across but in all the other animals the reactions had disappeared.

The progress of the treatments was followed by the daily examination of thick blood smears stained by a modified Field's method as described by Neave (1952). Using the 1/12 oil immersion objective, about 200 fields were examined on each slide. The results are shown in the accompanying table. All treated animals became blood negative 48 hours or less after treatment and with the exception of two animals in Group I and one animal in Group III, all remained negative during the 16-week observation period. The untreated controls remained infected, progressively lost condition and died at intervals until by the 10th week after treatment none remained alive.

The relapses in Group I occurred two and six weeks after treatment and the Group III relapse occurred four weeks after treatment. The two cross infection controls remained free of infection throughout the experimental period, thus suggesting that biting flies were not particularly active although it should be pointed out that the infected controls were all dead by the 10th week, and, therefore, a reservoir of infection was not present in the latter part of the experiment. A number of deaths occurred in the treated animals; one animal in Group I showed a heavy infection with Babesia and in spite of specific treatment death occurred during the first week. Another bull in this group died in week seven. It had had a heavy Babesia infection in week four and in spite of specific treatment gradually became weaker. In Group II two animals died in the fifth week. One of these had an acute cellulitis of the left foreleg and was unable to rise for some time before death; the other had been in a very weak condition when ethidium treatment was carried out and never improved afterwards. The other death was in Group IV in the eighth week and occurred suddenly without obvious cause.

The animals used in this experiment arrived in a thin and weak condition and were infested with ticks. Twice-weekly spraying with a BHC suspension reduced the tick burden

Treatment of *T. congolense* Infection with Ethidium Bromide

Group	Number of bulls at commencement	Dose	Daily blood examinations. Number of bulls showing one or more positive slides during week																Number of bulls at end
			Before treatment	Weeks after treatment															
				1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	
I	7	0·125 mg. per kg.	7	7	1	1	1	1	2	2	2	2	2	2	2	2	2	2	5
II	7	0·25 "	7	4	–	–	–	–	–	–	–	–	–	–	–	–	–	–	5
III	7	0·5 "	7	4	–	–	1	1	1	1	1	1	1	1	1	1	1	1	7
IV	7	1·0 "	7	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	6
V	7	1·5 "	7	3	–	–	–	–	–	–	–	–	–	–	–	–	–	–	7
Control ...	7	Untreated	7	7	6	6	5	4	2	2	1	1	All controls dead						0
Cross infection control ...	2	"	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	2

N.B.—The positive slides in post-treatment week 1 all occurred during the 48-hour period after dosing.

but there remained in many cases a protozoal infection of the red cells. The staining method used, whilst convenient for the detection of trypanosomes, did not allow the red cell infections to be followed closely, but there is little doubt that most of the deaths in treated animals were due to an exacerbation of the latent Babesia or Anaplasma infections. The control animals all died of clinical trypanosomiasis within 10 weeks of infection.

Discussion

Taking as the criterion of cure the absence of trypanosomes from the peripheral blood for a period of 16 weeks, treatment was successful in Groups II, IV and V. Ethidium bromide is, therefore, active against a Sudan strain of *T. congolense* at a dose of 1·0 mg. per kg., and can be active in lower doses.

Wilde & Robson (1953) used groups of eight cattle at dose levels of 0·1, 0·3 and 0·9 mg. per kg. There were four relapses at 0·1 mg. per kg., one at 0·3 mg. per kg. occurred seven weeks after treatment and in the 0·9 mg. per kg. group one occurred in the 16th week. The authors point out that it is possible that this latter case was a reinfection rather than a relapse in view of the length of time after treatment. However, in the absence of definite evidence of reinfection it must be regarded as a relapse. Wilson & Fairclough (1953) used groups of four animals at doses of 0·5, 1·0, 2·0 and 4·0 mg. per kg. and encountered no relapses on daily examinations over a period of 16 weeks.

From the results of these trials it can be concluded that it would be safe to adopt a standard dose of 1·0 mg. per kg. of ethidium bromide for the treatment of acute *T. congolense* infections of cattle.

Summary

Treatment of 35 cattle, syringe infected with *T. congolense*, with ethidium bromide at levels ranging from 0·125 to 1·5 mg. per kg. cleared the blood of trypanosomes within 48 hours. There were two relapses in the 0·125 mg. per kg. group and one in the 0·5 mg. per kg. group. Animals treated with 0·25, 1·0 and 1·5 mg. per kg. remained negative to daily blood examinations over a period of 16 weeks. There were five deaths attributable to intercurrent disease and seven untreated controls died from trypanosomiasis within 10 weeks.

Acknowledgments.—A series of experiments with ethidium bromide is being carried out jointly by the Research Department of Boots Pure Drug Co. Ltd., and the Sudan Veterinary Service. We are particularly indebted to the Director, Mr. J. T. R. Evans, B.Sc., M.R.C.V.S., and the staff of the latter organisation for their generous assistance in the execution of this work.

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Weekly Wisdom

We do not become stronger by imposing a uniformity of thinking on ourselves . . . we lose, in fact, what we are fighting for. The spirit of free enquiry, free thought, is the kernel of what we are defending.—Dean Acheson, former U.S. Secretary of State, acknowledging the Woodrow Wilson award.

CLINICAL COMMUNICATION

HYPERKERATOSIS IN THE BOVINE

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Introduction

The first record of hyperkeratosis seems to have been made by Gminder (1929), who reported a condition he named "Wendener Krankheit." More recently Olafson (1947) reported a chronic disease of unknown origin, first seen in 1941. It occurred in several herds, being characterised by papillary proliferations of the mucosa of the mouth, oesophagus, gall bladder and large bile ducts; proliferation and fibrosis of the small bile ducts; thickening of the intestinal mucosa and cystic dilatation of the collecting tubules of the renal cortex. The skin was thickened by hyperkeratosis over the upper two-thirds of the body. Gminder described the skin and oral lesions, but not the others. Olafson found that transmission experiments failed, that there were no ectoparasites, and that the vitamin A level of the blood was low.

Since Olafson's work, the condition has been diagnosed in at least 37 of the States of the United States, and many publications describing the condition are available, including a survey of available information issued by the United States Department of Agriculture (1949). Wagener (1951) described the condition as it has been known in Germany since 1946 and where it was associated with a particular wood-dressing which is not specified. Morrel (1950) reported that while the condition was not responsible for heavy losses over the United States, it might cause serious trouble in individual herds, particularly in the southern States, where it seemed to be more malignant. The condition appeared a little more often in beef herds and affected young animals more severely than old ones. Some animals may show only the skin lesions without any loss of condition, while others may die of the internal lesions without showing skin lesions. Olson, Cook & Brouse (1950) reported an outbreak in calves on a nutrition experiment. They found that certain foodstuffs, such as dried alfalfa and dicalcium phosphate, seemed to enhance the hyperkeratosis. Others, such as commercial vitamin A carrier and cottonseed meal, seemed to have some protective action against the enhancing properties of the others, but this protection was not absolute. Trace element and DDT content of the foodstuffs were not abnormal. Vitamin A and carotene contents of blood and liver of affected calves were normal. The liver selenium content of one calf was low. An investigation of the farm of origin of the calves showed that the condition was not present there, nor was it present in animals sold from this farm to other farms. Other bovines on the experimental station were not affected. The authors concluded that the condition is not infectious. Olafson & McEntee (1951) found that one particular batch of processed concentrate produced hyperkeratosis when fed to calves and adult bovines. The former developed general lesions, while a cow and a heifer showed only thickened hides. A calf suckling the cow died of hyperkeratosis at four months of age. Control animals under similar housing conditions, and fed a different concentrate, did not develop the condition. Guinea-pigs died in three weeks when fed the concentrate concerned, but rabbits, rats and mice were

not affected. Two lambs were fed the concentrate; one died after three months, showing focal necrosis of the liver and transudates in both body cavities, while the other, killed after five months, showed similar lesions. Washko, Green & Donham (1951) report the results of placing four experimental eight-month-old animals on a farm where the keeping of bovines had become impossible because of hyperkeratosis. One showed hyperkeratosis after four months and died later; one developed the skin condition two weeks later, but slowly recovered; the two remaining animals developed the condition after nine months. The three survivors which were taken off the farm recovered completely after a long interval. It was suspected that the wood preservative used on the farm was responsible for the condition. A benzene extract from an old silo was therefore fed to a calf daily for four months but was without effect. Shavings from the silo similarly had no effect in two months. Miller, Bortree & Shook (1952) reproduced the condition by stabling calves in a barn where the disease had occurred, in spite of thorough disinfection. It was also set up in calves by feeding timothy hay suspected of being contaminated with a wood preservative, by oral dosing with a petroleum ether extract of processed food which had produced the condition, and by oral dosing with small quantities of wood preservative. It also occurred after the application of a weak solution of wood preservative to the skin.

Recently, chlorinated naphthylene compounds have been incriminated as at least one cause of the condition. Sikes, Wise & Bridges (1953) report the reproduction of the condition by feeding and painting the skin with these compounds. Apparently, the greater the degree of chlorination, the more effective is the compound in producing hyperkeratosis; highly chlorinated naphthylene compounds have only recently been used. These compounds are finding an increased use in electrical insulators for wires, coils and transformers, in lubricants and in contact insecticides for greenhouse use. The latter use may explain why for some time DDT was suspected as the cause of hyperkeratosis. Sikes *et al.* (1953) reproduced the condition by painting the skin with old engine oil. Bourne (1952) also specifies lubricants as a cause of hyperkeratosis. With reference to the after-effects of hyperkeratosis, Olson, Cook & Brouse (1952) investigated the reproductive performances of 94 heifers which recovered from the disease, but no disturbance of the reproductive function was found.

Present Investigation

Case History

In 1952 a case of disease in calves in a pedigree Attested Dairy Shorthorn herd in mid-Cheshire was investigated at the request of the practising veterinary surgeon. In 1950 16 out of 18 calves had died on the farm of a condition diagnosed as atypical calf diphtheria. There had been no response to penicillin or sulphonamide treatment. No clinical cases occurred in 1951. In 1952 two calves out of 20 were found to be showing symptoms. In one calf these were excessive lachrymation resulting in a matting of the hairs on the face, excessive salivation causing frothing at the mouth, and great emaciation, stunted growth and weakness. Symptoms in the second calf were seen only as slightly excessive lachrymation with thickening of the skin and loss of hair round the eyes, associated with stunted growth. The first calf showed multiple proliferative lesions on the mucous membrane of the tongue and hard palate, but these were not found in the second. Small lesions were found in the mouth of one of the rest of the group which did not show any symptoms. The skin of both calves was thickened and wrinkled in the neck region, without loss of hair. A number of animals, however, showed baldness under the jaw. The temperature of all the calves was normal. Examination of the two survivors from the 1950 batch showed that they had gross hardening and thickening of the skin over the area from the middle of the masseter muscle back to the spine of the scapula on both sides, and extending ventrally between the forelegs. According to the owner, both these animals had been hairless over this area for nearly two years and the skin had presented a dry, grey, wrinkled appearance, like the skin of an elephant. Hair was beginning to grow again at the time of examination. One developed a number of warts in this area only. Both animals were poorly developed, being undersize for their age, and the horns were small, thin and malformed (Fig. 1). Two of the 1951 batch of calves, identical twins, showed the dry, grey, wrinkled, hairless skin over the angle of the jaw and upper part of the neck (Fig. 2). Otherwise there were no signs of the condition and physical development was normal. These animals had been reared in the same calf accommodation as the 1950 and 1952 batches.

Fig. 1.

Fig. 2.

In 1950 the old cow-byre had been converted into calf-rearing houses. All woodwork had been covered over by the application of a thick coating of a tar-creosote compound, and then by numerous layers of lime-wash. At first lime burning was suspected, but enquiry showed that affected calves appeared in only one box, whereas all the boxes were lime-washed. The calves in this box had access to an old door treated similarly to the other woodwork, but which they licked persistently. It was found that the original coating of this door was lead paint, and presumably the calves were licking to get at this. At least one sudden unexplained death had occurred in young calves in this box suggesting the possibility of lead poisoning. That calves will go to great trouble to lick lead paint is well known.

Hyperkeratosis was diagnosed, and the more severely affected calf removed for *post-mortem* examination. The farmer was advised to remove calves from the box and replace the painted door before reintroducing any others, to remove as far as possible the creosote compounds, and to supplement the diet of the remainder of the group with vitamin A. These measures have been taken and 15 months afterwards no further signs of the condition have appeared.

Post-mortem Examination

The tongue had numerous proliferative lesions, varying from $\frac{1}{4}$ to $\frac{3}{4}$ inch in diameter, on the dorsum and on the sides. Some were nodular, while others were arranged in a ring form, suggesting that the centre had been a vesicle, although there was no direct evidence of this. Lesions were also found on the cheeks, and dental pad. On the hard palate flat lesions were found, surrounded by a haemorrhagic zone (Fig. 3).

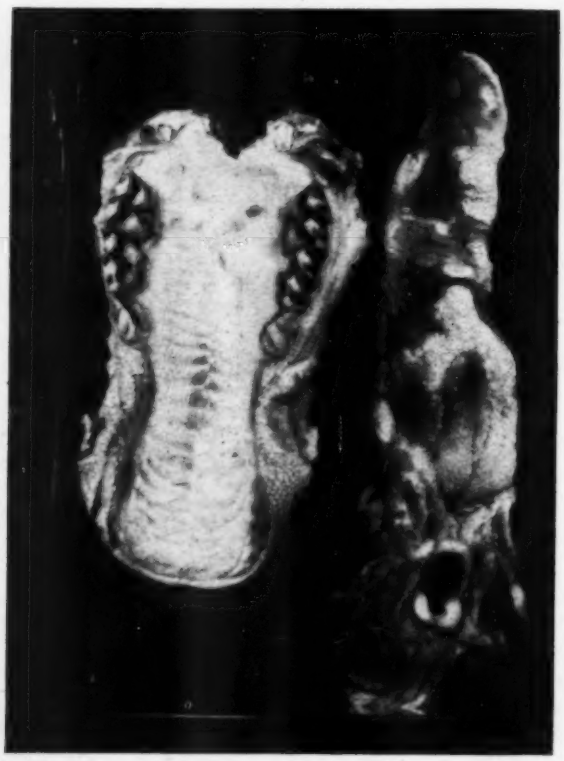

Fig. 3.

Nodular lesions were not found in the oesophagus, as reported by Olafson, but were found in the duodenum. The fourth stomach had multiple pin-head ulcers, and a few bigger, very shallow erosions. Although the animal was killed for *post-mortem* examination and seen immediately after death, the liver was unusually crumbly. The proliferation of the bile ducts, seen in microscopic section, was not evident on macroscopical examination. No lesions were found in the gall bladder or large bile ducts. Perhaps the most striking lesion was in the kidneys, which were white in colour, very heavy, and hard to cut. The cut surface showed streaks of fibrosis in the cortex (Fig. 4).

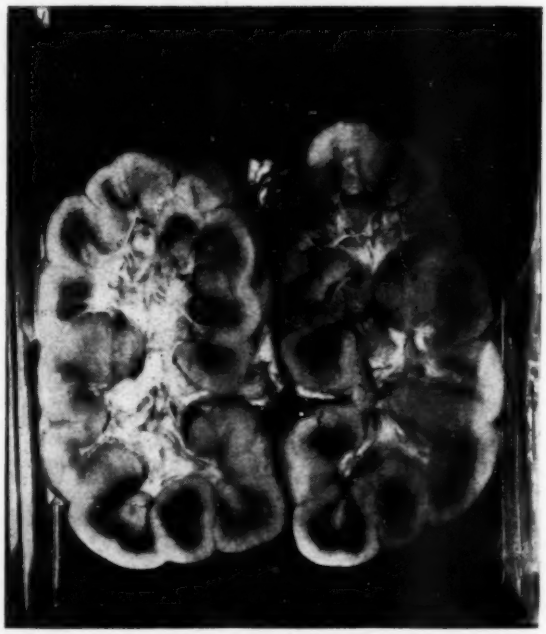

Fig. 4.

The only other lesion found was thickening and drying of the skin in the neck region, so that it felt like a partially cured hide. Extensive examination for ectoparasites gave negative results.

No organisms were isolated in cultural examination of all organs showing lesions.

Histological Examination

Sections showed marked keratinisation of the skin, the hair follicles in the deeper layers showing this particularly well. There appeared to be no defensive cellular reaction to the condition. The liver sections showed marked proliferation of the bile ducts and cloudy swelling in the parenchymatous cells, but there was no fibrosis. Kidney sections showed cystic dilatation of the collecting tubules, associated with fibrosis (Fig. 5).

Experimental Work

A suspension in normal saline of lesions from all organs affected and from their associated lymph glands was inoculated into an anaesthetised calf by the intradermal, subcutaneous and intravenous routes, and by submucosal and deep injections into the tongue. No temperature reaction occurred in this calf and no lesions developed in two

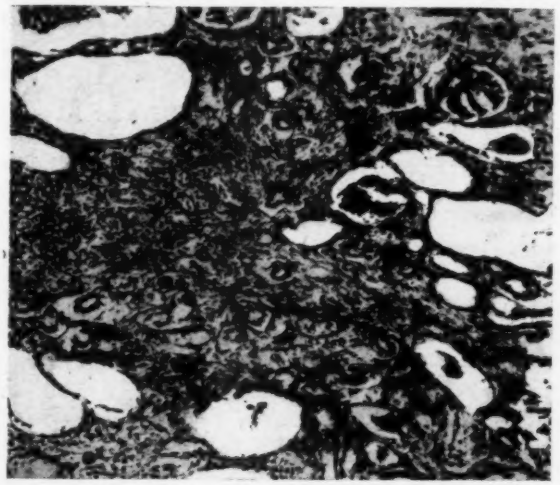

FIG. 5.

months, apart from the fact that the sites of intradermal inoculation on the neck were evident on palpation and skin measurement. As indicated below, hyperkeratosis was later produced in this calf by other means. Section of a biopsy sample of one of these intradermal nodules showed a certain amount of fibrosis, but the picture was not clear. Control inoculation sites on the opposite side of the neck where sterile saline was injected were not palpable or measurable from the day after inoculation. It is probable that some reaction to infection was the cause of these nodules, as the inoculation material could not have been sterile. The second calf from the farm, showing slight lachrymation, was procured and placed in contact with the experimental calf during this period. It was decided at the end of two months that this effort to reproduce the condition by contact and inoculation had failed.

Accordingly, after two months it was decided to try to reproduce the condition by the application to the skin of the creosote compound actually used on the farm. A clipped area 6 inches square on one side of the neck was painted daily for a month with undiluted creosote. At the end of this period the skin over the area was thickened, dry and hairless. After reading the work of Miller *et al.* (1952) painting was continued for another month using a solution of one part of creosote in five parts of acetone. During this second month areas of skin on the same side of the neck, on the jaw, top of the head and shoulder began to develop lesions which were grey, dry, raised and hairless, not unlike ringworm lesions, although examination for ringworm was negative, and the condition did not spread to the animal in-contact. These lesions were rapidly followed by similar areas on the other side of the body. They merged into the painted area until the whole of the neck on both sides, and ventrally, presented a typical picture of hyperkeratosis, the skin being markedly thickened, hairless and thrown into folds.

It was not clear whether these lesions had developed as a result of the original inoculations alone, whether some infective agent was developing due to the effects of the creosote, or whether they were the result of the application of creosote alone. In order to establish whether the latter was the case, another experimental calf was kept in a separate box and an area on the neck painted with the creosote solution in acetone. After six weeks the skin on both sides of the neck and under the jaw was thickened, wrinkled and hairless, and the appearance was one of a typical case of hyperkeratosis (Fig. 6). Examination for ectoparasites was negative.

FIG. 6.

Both these animals were killed and *post-mortem* examinations carried out. The skin lesions were typical in each case, histological examination showing marked keratinisation. Lesions of internal organs were not apparent to the naked eye, apart from circumscribed pale areas in the kidney cortex of the second calf. Histological examination of this kidney showed cloudy swelling and degeneration of the tubular epithelium, particularly in the cortex, and to a lesser extent in the medulla. Degenerative changes were also present in the kidney of the first calf, and the livers, testes and epidimes of both calves.

Vitamin A and carotene estimations were carried out on the liver of the second calf. These were 44 μg. per 100 g. carotene and 11·1 I.U. per gramme vitamin A. The latter figure is said to be on the low side.

Discussion

It appears from this small experiment that hyperkeratosis was produced by the application of a certain creosote compound to the skin. It seems unlikely that the condition was caused by a latent infective agent which became active after changes had occurred as a result of the application of the creosote. In spite of the findings of Olson *et al.*, it seems likely that Olafson's first observation that a vitamin A deficiency is induced may be correct. This theory is strengthened by the work of Hansel, McEntee & Olafson (1951), who found that plasma vitamin A levels decreased rapidly after hyperkeratosis-producing substances had been fed, that this decline preceded other symptoms, that the effect was prolonged for a month after feeding of the substance had ceased, that feeding of vitamin A in large amounts only served to elevate the blood and liver levels of vitamin A while the vitamin was being fed, and that the feeding of carotene elevated only the blood carotene level, and not the vitamin A level. They argue from this that the substances inducing hyperkeratosis interfere with the conversion of carotene into vitamin A in the liver. Vitamin A was fed to the calves on the affected farm in Cheshire after their removal from the calf box and they have developed quite normally since then. Whether the vitamin A had any effect is unknown, as no controls were kept. It is of interest that a calf brought to this department from the farm has shown no signs of deterioration but has improved in condition and development. It received

a vitamin A supplement for about a month on the farm, but had no more after its removal. It would appear to have overcome the condition.

Summary

1. Hyperkeratosis is reported in bovines in Britain.

2. The symptoms in two calves and four adult animals are described. Earlier heavy losses on the same farm are attributed to the condition.

3. The *post-mortem* findings in a calf are described and illustrated.

4. The experimental reproduction of the condition in two calves by the painting on the skin of a particular creosote compound is described.

Acknowledgments.—The acknowledgments and thanks of the author are due to Mr. W. F. Morton, M.R.C.V.S., of Alderley Edge, for bringing the case to his notice; to Miss J. S. Hurrell for photographs taken on the farm; to Mr. H. P. Harding, B.Sc., M.R.C.V.S., for the photographs of *post-mortem* specimens and the microphotographs and to Professor R. E. Glover, M.A., B.Sc., F.R.C.V.S., for his constant interest and help.

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NEW CONDITIONS FOR SALE OF CONDEMNED MEAT

The Minister of Food recently announced new conditions for the sale by auction of condemned meat and offals from Government slaughterhouses. Meat and offals bought at auctions must in future be processed, boiled, or sterilised by the buyer before resale. If the meat is resold to a retailer for animal feeding or to a processor, the liability for processing, boiling, or sterilising must be included in the contract of sale. Condemned meat which has not been treated in this way can be sold to zoos, menageries, and for other specified purposes.

Local authorities are being advised that they will be permitted to remove and dispose of any meat or offals at Government slaughterhouses found to be unfit for human consumption. Proceeds of such sales will be remitted to the Ministry.

ABSTRACTS

Cobalt in the Nutrition of Sheep

Under the above title the issue of *Nature* for November 8th, 1952, contains three separate contributions by workers at the C.S.I.R.O. Division of Biochemistry and General Nutrition, University of Adelaide.

I*.—The intramuscular injection of vitamin B_{12} at a rate equivalent to 300 μg. weekly was found to be completely curative in the case of young Merino ewes from an experimental flock that had grazed on frankly cobalt-deficient pasture for approximately a year and were in an advanced state of cobalt deficiency. The oxygen-carrying capacity of their blood was of the order of only eight volumes O_2 per 100 ml. and their bodyweights only about 20 kg. The response was fully equal to that of oral dosing with cobalt (Co).

It is concluded from these and other studies that unequivocal evidence has been obtained that the deficiency-syndrome suffered by sheep on Co-deficient pasture is, in fact, due to lack of vitamin B_{12}. The vitamin B_{12} requirements of ruminants, normally furnished by synthesis, are regarded as probably of a higher order than in the case of other animals. Earlier trials with lower doses of vitamin B_{12} had proved negative.

II†.—Mature sheep (40 to 50 kg.) were maintained in positive energy balance and in excellent health when housed in metabolism cages and provided with a supplement of Co in addition to a basal daily ration of 1 kg. Co-deficient wheat hay and 50 g. washed wheat gluten. This provided 4,100 kcal (gross) of combustible energy, of which 40 to 42 per cent. was voided in the faeces, and the protein equivalent of 18·3 g. N, of which 5·9 g. N appeared in the faeces.

With the basal ration above (which provided < 25 μg. Co a day) there was an eventual loss of weight and the development of typical symptoms of Co deficiency. The faecal vitamin B_{12} excretion of Co-deficient animals fell by nearly 90 per cent. A prompt rise in vitamin B_{12} activity of the faeces and remission of symptoms could be effected by oral dosage with Co. Neither Co by mouth nor vitamin B_{12} by intramuscular injection effected any change in the overall digestibility of the fodder.

It is concluded that the syndrome of Co deficiency in the ruminant is the result of a metabolic defect arising from a profound deficiency of vitamin B_{12}, and that for some unknown reason the B_{12} requirements of ruminants are greater than those of other animals. "There is no evidence that cobalt performs any physiological function in the tissues of animals other than as a constituent of vitamin B_{12}."

III‡.—From samples collected in the preceding study it was concluded that there are at least two "B_{12}-like factors" in sheep faeces and that their absolute and relative concentrations depend upon the level of available Co in the gut. The vitamin B_{12} activity obtained from the use

* **I.—Response of Cobalt-deficient Sheep to Massive Doses of Vitamin B_{12}.** Marston, H. R., & Lee, H. J. *Nature, Lond.* **170.** 791.

† **II.—Control of Cobalt deficiency in Sheep by Injection of Vitamin B_{12}.** Marston, H. R., & Smith, R. M. *Nature, Lond.* **170.** 792–793.

‡ **III.—Influence of Cobalt on the Production of Factors Possessing Vitamin B_{12}-like activity in the Faeces of Sheep.** Dawbarn, Mary C., Hine, Denise C., & Hughes, Patricia. *Nature, Lond.* **170.** 793.

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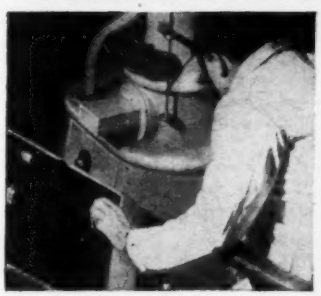

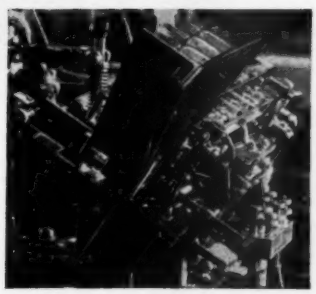

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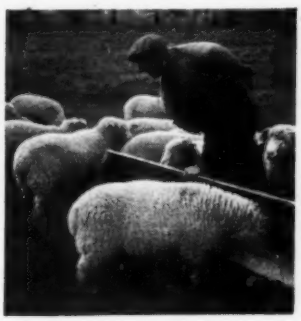

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of *E. coli* as the test organism was always higher than that obtained in assays employing *Lactobacillus leishmannii*, the ratio varying from 1·4 to 2·4 : 1.

A. N. W.

* * * *

Response to Vitamin B_{12} of Grazing Cobalt-deficient Lambs*

Trials were conducted with Romney-Southdown cross-bred lambs that were approximately six and a half months old at the commencement of the trials. They had been confined to the same paddock since birth, and showed evidence of cobalt deficiency as judged by small or erratic gains in weight and unthriftiness. Previous studies had confirmed the low cobalt status of the pasture and of the livers from similar lambs, and the significant response of such animals to dosing with cobalt.

In observations lasting for nine weeks the response of individual lambs to a total dosage of 800 μg. vitamin B_{12} given intramuscularly was fully equal to that of others dosed with a total of 32 mg. cobalt. A. N. W.

* * * *

Seasonal Variations in the Ruminal Organisms of Grazing Sheep†

The microflora and microfauna of the rumen of three Merino wethers were examined monthly over a period of 19 months. The samples of rumen liquor were obtained by stomach tube. The sheep were grazing on annual pastures consisting mainly of subterranean clover and capeweed, the latter having a somewhat lower protein content than the clover.

The numbers of total organisms showed marked seasonal fluctuations with a high level associated with the green grass of winter and spring, when the protein level is maximal, and a low level associated with the dry grazing of summer.

A great variety of organisms were found to be present and the balance between the organisms was shown to change at different times of the year. The numbers of protozoa and the organism *Oscillospira guilliermondi* showed a population trend similar to that of the total number of organisms in the rumen.

It is probable that the fluctuations in density of the organisms are associated with changes in the chemical composition of the diet, including the protein and carbohydrate levels, but other constituents so far not investigated may also play an important part.

F. R. B.

* **Response to Vitamin B_{12} of Grazing Cobalt-deficient Lambs.** Anderson, J. P., & Andrews, E. D. (1952). *Nature, Lond.* **170.** 807.

† **The Seasonal Variations in the Ruminal Organisms of Grazing Sheep.** Moir, R. J. (1951). *Aust. J. Agric. Res.* **2.** 392–330.

REVIEWS

[**The Art of Scientific Investigation.** By W. I. B. Beveridge. Second edition. London: William Heinemann. (1953). Pp. xii + 176. Five plates. Price 10s. 6d.]

It is three years (1950) since the first edition was published and reviewed (*Vet. Rec.* **63.** 102) and in the review there was some criticism of the temerity of the author in branching out into a field of applied psychology when his own field is a study of infectious diseases. A second edition usually means that there has been a popular demand for the first edition and the author has therefore been justified in branching out into another field; it has been a successful venture to which we add our congratulations.

In his preface to the second edition the author acknowledges the endorsement he has received of the methods of research he outlined. He has also made minor adjustments and rewritten the chapter on Reason. The book follows the pattern of the first edition with an additional plate, containing pictures of four more scientists. There are, however, some minor points which remain and could be corrected; is it quite right to say that " Florey took up the work from where Fleming left off " when discussing penicillin? Tens of thousands is a lot when applied to mice and did Professor F. M. Burnett autopsy all of them? Ought not the author to give his old colleague the title he has received and so richly deserved; he gets it with his picture but not in the text of the book. There are six additions in the list of publications but they are added, and not fitted into the list in accordance with an alphabetical order. These little details are unfortunate because the book has clearly been popular and the author has taken trouble to correct many of the small points made by reviewers. In spite of all this, the book will continue to be read by those who are interested in how other people work and how many of the discoveries in biology have been made.

* * * *

[**" Call the Vet."** By Nancy Martin. Macmillan & Co., St. Martin's St., London, W.C.2. General edition, 6s. 6d.; School edition, 4s. 6d.].

This is an interesting and readable story that can be highly recommended for teen-agers. It is about the experiences of a town boy visiting a farm for a few weeks. Two days of the eventful life of a country veterinary surgeon are described well and fully. There are some statements with which a practitioner would disagree, but these would not bother a youthful reader, who, if fond of animals and country life would find this an engrossing book.

Veterinarian's Poultry Show Successes.—We are interested to learn that Mr. R. R. Bugg, M.R.C.V.S., of Winslow, Bucks, exhibiting at the National Poultry Show, won the Sainsbury Challenge Cup for the two best birds in the show and also two first prizes, two seconds, one third and one very highly commended. Mr. Bugg also did well with table poultry at Smithfield, securing one first prize, one third, one reserve and one very highly commended.

XUM

REPORT

[Report of the Ministry of Health, April 1st, 1950, to December 31st, 1951.* Part III: On the State of the Public Health. London: H.M.S.O. (April, 1953). Price 6s. 6d.]

The state of the public health during 1951 is interesting to us as citizens and some parts of the report are revealing to us as veterinary surgeons. Fifteen sections and appendices tell us of the general epidemiology of the diseases which beset us and of the laboratory services which are available for diagnostic purposes. Special sections deal with international health, the dental health services, nutrition, maternal and child care and other aspects of the "state of the public health."

The population of England and Wales, which is a little over 43,000,000, had a crude death rate of 12·5 per 1,000 population and an infant mortality rate of 29·7 per 1,000 live births. During the year suspected smallpox was reported to the Ministry on 189 occasions and in 27 of the patients the suspicion that they were suffering from smallpox was confirmed. There was a low total of diphtheria cases and deaths, but it would be dangerous to become complacent, and it has been demonstrated that dire results may accrue if a virulent form of diphtheria becomes established in an unprotected community. Scarlet fever was mild and the incidence was the lowest on record; measles and whooping cough were very prevalent and influenza deaths in the first quarter of 1951 were far in excess of those in the same period in any of the preceding 14 years. The outstanding feature concerning poliomyelitis was the large increase in the proportion of non-paralytic cases compared with previous experience.

The total number of incidents of food poisoning reported was 3,347, comprising 343 outbreaks, 287 family outbreaks and 2,717 sporadic cases. There are one or two outstanding features and one concerns the frequency with which meat is mentioned as a vehicle of infection; 66 per cent. of outbreaks, where the vehicle of infection was noted, were associated with meat dishes and 75 per cent. of the dishes were processed or made-up meats. Although salmonella, and especially *Salm. typhi-murium*, were the commonest known infective agents there were a large number associated with staphylococci and with *Clostridium welchii*. Salmonella outbreaks in hospitals often begin when a patient, usually a child, is admitted to hospital with some other disease; the outbreaks are sometimes of long duration. The outbreaks associated with *Cl. welchii* are characterised by an incubation period of 10 to 18 hours, and by colic and diarrhoea, usually without vomiting. The strains of *Cl. welchii* are often present on the meat when it arrives in the kitchen of the canteen or institution, in which places such outbreaks have occurred. If after initial cooking, during which some heat-resistant cells survive, there are opportunities for bacterial multiplication, *Cl. welchii* may increase sufficiently to cause symptoms when ingested.

Rabies continues to be a very rare disease in this country and there have been only two confirmed human cases since 1922, both infected abroad. The problem of leprosy has been attacked by new regulations which enable a patient to receive such specialised examination and treatment as his condition requires; at the time of writing this report —spring 1952—there were just over 100 known cases of leprosy in England and Wales.

The laboratory services study many problems; they are endeavouring to ascertain the frequency of salmonella in different animals and different natural foodstuffs, especially in duck eggs. *Salm. dublin* has been found in 10 per cent. of faeces of cattle imported from Northern Ireland and in 3·7 per cent. of non-Irish cattle. Salmonella organisms belonging to a variety of types have also been found in a very high proportion of tortoises examined. Work on the serological types of *Bact. coli* associated with outbreaks of gastro-enteritis in infants continues, and although opinion as to there being a causal relationship between these bacteria and the disease is divided, the balance appears to be in favour of such relationship. Some work on hydatid disease is proceeding though the disease in Great Britain is uncommon; the main conclusion at the moment is that complement-fixation tests as well as skin tests should be made in suspected cases. One curious item relating to the transference of a study from the Ministry of Agriculture and Fisheries to the Public Health Laboratory Service concerns the diagnosis of the specific disease of fish caused by *Chromobacterium salmonicida* and known as furunculosis.

Medical officers of health have been making use of the powers afforded by the Milk and Dairies Regulations, 1949, which enable them to stop the supply of milk which is known or believed to be causing disease in human beings, or to insist on its being heat treated so as to prevent the spread of infection. A paragraph explains the rarity of a bacteriaemia in cows with Brucella infection, and that excretion of Brucella in the milk of a cow infected with the disease is irregular and intermittent. It would be better to give a more explanatory note and one in greater detail if the medical men who read this report want information on an aspect of veterinary pathology.

Special attention has been paid to current aspects of human health and a short report on cancer of the lung indicates that a case has been made out for further investigation on the relationship between bronchogenic carcinoma and excessive cigarette smoking. It is doubtful if a longer and more exhaustive study of the statistical data already available would lead to more definite conclusions; further studies of additional data are required if progress is to be made towards the solution of this problem. Another interesting account concerns the outbreak of food poisoning due to infection with *Salm. minnesota;* it was widespread and associated with the consumption of meat pies. This salmonella had hitherto been reported as an organism infecting poultry and in spite of the searches made into the gelatine used in the pies, the pork and the mesenteric glands of pigs, the problem of the origin of the infection was not solved.

This country owes much to its medical officers of health and to all those who contribute to the excellent "state of the public health" and this is a review of many activities which contribute to that state; it is not a dull document but one full of human interest. **R. L.**

* The Ministry's Report for the year 1952, which was issued last week, will be reviewed shortly.—*Editor.*

£12,000 LOSS ON ROYAL SHOW

A loss of £12,077 on the annual show in 1952, held at Newton Abbot, is recorded in accounts presented at the annual meeting of the Royal Agricultural Society of England in London recently. No cloven-hoofed animals were exhibited because of foot-and-mouth disease restrictions.

The Queen, who is to be President of the Society next year, has presented three trophies for competition at the show to be held in Windsor Great Park from July 6th to 9th. She is to attend on two days. In 1955 and 1956 shows will be held at Nottingham and Newcastle upon Tyne.

Membership of the Society now totals 15,676 compared with 17,203 in 1952, and 18,613 in 1951.

QUESTIONS IN PARLIAMENT

The Animal Health Trust

In the House of Lords on December 8th, Lord Dowding asked Her Majesty's Government whether the organisation known as the Animal Health Trust has premises registered and workers licensed for vivisection.

The Joint Parliamentary Under-Secretary of State for the Home Department (Lord Lloyd): My Lords, four research stations belonging to the Animal Health Trust are registered under the Cruelty to Animals Act, 1876. Nineteen scientific officers of the Trust are licensed for work under the Act at these stations. In addition, some research Fellows working at universities under the auspices of the Trust also hold licences under the Act.

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Myxomatosis

Major Anstruther-Gray (December 7th) asked the Minister of Agriculture to what extent myxomatosis has spread during the last month; and how many rabbits are estimated to have died of this disease since it was first reported.

The Joint Parliamentary Secretary to the Ministry of Agriculture and Fisheries (Mr. G. R. H. Nugent): In the past four weeks five fresh outbreaks of myxomatosis in wild rabbits have been confirmed. There are now three centres of infection in Kent, two in East Sussex, two in Essex and one in East Suffolk. The most recent outbreaks are in Essex, East Suffolk and Kent. There has been no appreciable local spread of the disease at the existing centres of infection. About 800 rabbits are known to have died of the disease since it was first reported. More infected rabbits may have died in their burrows either from the disease or gassing.

Major Anstruther-Gray: Does my hon. Friend know whether any rabbits have survived in the infected areas or whether they have all been killed in those areas?

Mr. Nugent: In some of the infected areas we have been able to enclose them by wiring, but in others that has not been possible. In the first case, we have exterminated them. In the second case we have not.

Mr. Woodburn: What is the Government's policy towards rabbits? In past debates it has been said that they were pests and must be destroyed; now we are discussing how they can be preserved. What is the Government's policy?

Mr. Nugent: Our policy is to control this disease until we have been able to take a balanced view as to whether it is desirable to allow it to exterminate rabbits in this country by a process which is particularly unpleasant and painful for the rabbit.

Mr. Nicholson: I was not quite clear about the meaning of my hon. Friend's last reply. Will he confirm that it is the inflexible policy of his Department to stamp out this disease, both for economic reasons and because it is of such a peculiarly revolting nature?

Mr. Nugent: No. I thought I was quite clear in my reply. At present we are trying to contain the outbreaks of this disease until we have had time to make an expert examination to decide whether or no it should be allowed to run free in the country.

Sir J. Lucas: Does the disease also affect hares?

Mr. Nugent: Yes, Sir.

Mr. Hastings: Would the hon. Gentleman say what are the latest ideas as to how this disease is conveyed? Is it by birds or by human beings, or only by direct contagion?

Mr. Nugent: I think it is probably conveyed by direct contact between the rabbits and by insects—probably to some extent by birds as well, but mainly by insects in the spring and summer.

Colonel Gomme-Duncan: As, in France, it has been found to be spread by fleas and similar insects, is it not completely useless to wire round the areas where infected rabbits are found?

Mr. Nugent: I can assure my hon. and gallant Friend that in the winter the activity of the fleas and other insects is relatively dormant and, therefore, this method is effective.

Lieut.-Colonel Lipton: Can the Parliamentary Secretary say what is the effect which a rabbit suffering from this disease has on a fox which eats it, because it may have an adverse effect on the future of fox hunting if the foxes also die from this disease?

Mr. Nugent: My reply is, none that I know of.

Sir T. Moore: In view of the reports of the horrifying nature of the death of the rabbits from this disease, will the Government take every step to stamp it out or control it at the earliest possible moment?

Mr. Nugent: That is what we are now doing.

Mr. I. O. Thomas: Can the Minister say what steps have been taken, or are to be taken, in connection with the control of the sale of these infected rabbits for human consumption?

Mr. Nugent: None of the infected rabbits which we are able to catch and destroy is, in any circumstances, being offered for human consumption.

Major Beamish asked the Minister of Agriculture whether he is aware of the effect that the recent outbreak of myxomatosis has had on the demand for rabbits and, consequently, on the operations of rabbit catchers, as well as the risk which may result from an increase in the rabbit population, and the consequent loss of crops; and if he will make a further statement on the matter, with particular reference to any dangers there may be to human beings as a result of the outbreak of this disease.

Sir T. Dugdale: I am aware that the recent outbreaks of myxomatosis in this country are said to have reduced the sale of rabbit meat and, consequently, the activities of rabbit catchers. There are, however, other and usually more effective means of protecting crops from rabbits, such as gassing them in their burrows. I am advised that there is no danger to human beings from myxomatosis.

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Imported Animals (Foot-and-Mouth Disease)

Brigadier Medlicott (December 7th) asked the Minister of Food if he is aware of the dangers to health arising from the eating of meat from imported animals which have suffered from foot-and-mouth disease; and if he will strengthen the precautions aimed at preventing importations of this kind.

The Minister of Food (Major Lloyd George): Provided the animal is not suffering from foot-and-mouth disease when slaughtered and the meat is otherwise fit for human consumption there is no danger to health. The control of imports of live animals is a matter for my right hon. Friend the Minister of Agriculture and Fisheries.

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Abattoir Improvements (Cost)

Mr. Padley (December 7th) asked the Minister of Food the cost to his Department since the inception of the meat control scheme in January, 1940, of carrying out improvements in abattoirs, including adaptation and extension of premises, provision of new equipment, provision of electric saws and electrification of winches.

Major Lloyd George: I regret that the cost of most of these items cannot readily be separated from the cost of maintenance. The cost of electric saws and the electrification of winches which has been separately recorded is a little over £150,000.

Mr. Padley: In view of the substantial investment of public funds in abattoirs over the last 13 years, will not the Minister reconsider the decision to hand this valuable property, containing these public investments, back to private owners, or is it the Government's intention once again to hand valuable national assets to private interests at knock-down prices?

Major Lloyd George: One-third of these slaughterhouses belong to local authorities. I am not apologising for the other two-thirds. They are entitled to them, they run them and they built them themselves. Why should they not be allowed to retain them? Hon. Members ought to realise that the slaughterhouses were taken away compulsorily from the owners. The whole future of slaughterhouses is now under investigation by an interdepartmental committee.

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Condemned Meat (Conditions of Sale)

Mr. Janner (December 8th) asked the Minister of Food whether he has yet introduced the revised conditions of sale for condemned meat; and what are these revised conditions.

Major Lloyd George: Yes, Sir. I will, with permission, circulate in the *Official Report* a summary of the revised conditions which are of special interest to hon. Members.

Following is the summary:—

1. Condemned meat and offals from Government slaughterhouses bought at auctions must now be processed, boiled or

sterilised before re-sale. Where the meat is re-sold to a retailer for animal feeding, or to a processor, the liability for processing, boiling or sterilising must be included in the contract of sale.

2. The revised conditions of sale also require sellers of raw condemned meat and offals to inform the medical officer of health in the area where the meat is delivered of the names and addresses of the consignees.

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ALLOCATION AND SITING OF ABATTOIRS

Mr. DEEDES (December 8th) asked the Minister of Food whether, in the light of the Government White Paper, Command Paper No. 8989, he will accelerate the work of the committee considering the allocation and siting of abattoirs.

Major LLOYD GEORGE: The committee are well aware of the urgency of the problems referred to them and of the need for an early report.

Mr. DEEDES: While I appreciate the difficulties of my right hon. and gallant Friend and also that the committee is bound to take a certain amount of time, will my right hon. Friend consider the possibility of substituting an interim plan whereby some marketing centres, like Ashford, which are concerned about the future, may commence planning for slaughterhouses and make provision for the siting of abattoirs?

Major LLOYD GEORGE: I can tell my hon. Friend that the interim scheme is looked upon as a matter of urgency now.

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SLAUGHTERHOUSES AND KNACKERIES

Mr. N. MACPHERSON (December 9th) asked the Minister of Food what qualifications officials of his Department who visit slaughterhouses and knackeries have to enable them to judge by the condition of the carcases whether the horses have been bled with the object of selling the horsemeat as veal.

Major LLOYD GEORGE: The officials who visit slaughterhouses are either veterinary surgeons or qualified meat inspectors. Those of my officers who visit knackeries are concerned solely with the enforcement of staining requirements and the question of professional qualifications does not arise.

Mr. N. MACPHERSON (December 9th) asked the Minister of Food how many unheralded visits have been paid by officers of his Department to slaughterhouses and knackeries in the last six months; and whether they invariably examine the humane killers to ensure that they are in current use and in good condition.

Major LLOYD GEORGE: None. The responsibility for ensuring the observance of the Slaughter of Animals Act rests with local authorities.

So far as slaughterhouses used by my Department are concerned I am satisfied that my officers are taking all necessary steps to ensure that the statutory provisions are observed.

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RACE HORSE GAY TIME

Mr. E. JOHNSON (December 3rd) asked the Minister of Agriculture the nature of the ailment on account of which it was decided that the horse Gay Time was not suitable to be kept as a stallion at the National Stud.

Sir T. DUGDALE: Gay Time developed an obstruction in the throat which seriously reduced his intake of air when galloping and made him unfit to race. The veterinary surgeons who examined the horse did not consider that the symptoms were those commonly associated with laryngeal paralysis, namely, whistling or roaring.

Mr. JOHNSON: Does my right hon. Friend think that there is a ready market in Japan for horses which have gone in the wind, and, if so, will he make that known to owners of such horses?

Sir T. DUGDALE: I do not think that that arises. The veterinary report was made available to the Japanese Government, and it did say that the stallion was suitable for breeding.

Mr. BENCE: Can the Minister give the House an assurance that this stallion had not been eating caponised cockereis?

Mr. E. JOHNSON asked the Minister of Agriculture the position in regard to the free nomination to Gay Time, on his retirement to the stud, which was given to the horse's previous owner as one of the conditions of his sale to the National Stud.

Sir T. DUGDALE: I am communicating with the previous owner on this matter and will let the hon. Member know the position in due course.

Mr. CROUCH asked the Minister of Agriculture the contents of the veterinary report on Gay Time before conclusion of the purchase by the National Stud.

Sir T. DUGDALE: The veterinary surgeon who examined Gay Time shortly before the purchase found him to be sound for racing.

Mr. CROUCH asked the Minister of Agriculture what bodies the National Stud consulted before paying £50,000 for Gay Time; and before selling him for £15,000.

Sir T. DUGDALE: The decision to purchase Gay Time was taken after consultation with a small informal committee appointed to advise on the selection of stallions for the National Stud. Several prominent breeders, including the members of the committee, were consulted before it was decided to sell the horse.

Mr. CROUCH: Is my right hon. Friend completely satisfied with the way in which advice he receives is given to him? Does he not think that there should be an enquiry into the running of the National Stud?

Sir T. DUGDALE: That is an entirely different question. I am absolutely satisfied, as far as this horse is concerned. As my hon. Friend, who takes an interest in this sport, realises, whenever a horse is discussed, many opinions are forthcoming on the subject.

NOTES AND NEWS

BRITISH VETERINARY ASSOCIATION

CHANGE OF ADDRESS

MEMBERS, OTHER READERS AND ADVERTISERS are requested to note that the

ADDRESS OF THE BRITISH VETERINARY ASSOCIATION AND "THE VETERINARY RECORD"

is now

7, MANSFIELD STREET, PORTLAND PLACE, LONDON, W.1.

Telephone number: Museum 6541

The offices will be open throughout the day on Christmas Eve, but closed on Monday, December 28th.

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Diary of Events

Jan. 6th.—Meeting of the Association of Veterinary Teachers and Research Workers, at the Royal (Dick) School of Veterinary Studies, Edinburgh, 10 a.m.

Jan. 13th.—Meeting of the R.A.V.C. Division of the B.V.A., at Langley Court, Beckenham, Kent.

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CHANGE OF DATE OF NEXT MEETINGS OF COUNCIL AND COMMITTEES, B.V.A.

Owing to the fact that headquarters has moved to 7, Mansfield Street just before Christmas, the meetings fixed for early January (6th, 7th and 8th) have been postponed until Wednesday, Thursday and Friday, January 20th, 21st and 22nd, 1954.

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R.C.V.S. LIBRARY

Members are requested to note that the Library of the Royal College of Veterinary Surgeons will be closed as from 1 p.m. on Christmas Eve, but will be open again as usual on Monday, December 28th.

PERSONAL

Births.—Hoffe.—On December 5th, 1953, to Ann, wife of Ivan A. Hoffe, M.R.C.V.S., at Kota Bharu, Kelantan, Malaya, a sister for Christopher and Michael, Madelein Frances.

Warren.—On December 1st, 1953, to Dorothy and Tony, a son—Mark Anthony.

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Marriage.—Forsyth—Freeth.—On December 5th, 1953, at St. Mary's Church, Kempsford, Harry Forsyth, M.R.C.V.S., Lechlade, Glos, to Stella Freeth, Dudgrove, Fairford, Glos.

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Appointments.—Appointments in the Colonial Veterinary Service are announced of Mr. F. J. R. R. Menard, M.R.C.V.S., as Temporary Veterinary Officer, Jamaica, and of Mr. G. C. Vickers, M.R.C.V.S., as Veterinary Officer, Jamaica.

Ministry's Veterinary Field Staff.—The following intimations have been received:—

Mr. J. H. Patterson, M.R.C.V.S., Divisional Veterinary Officer, Edinburgh, has been promoted to Superintending Veterinary Officer. He will be stationed at Stirling as and from January 11th, 1954.

Mr. John Stewart, M.R.C.V.S., Veterinary Officer, Maidstone, has been promoted to Divisional Veterinary Officer and will be stationed at Head Office Tolworth as from January 11th, 1954.

Capt. Q. A. Stewart, M.R.C.V.S., Divisional Veterinary Officer, Ayr, retires on December 20th, 1953.

The following have been appointed to the permanent staff as Veterinary Omcers.—Mr. A. J. Crowley, B.V.Sc., M.R.C.V.S., stationed at Northampton: Mr. T. D. Evans, M.R.C.V.S., stationed at Haverfordwest and Mr. A. H. Watson, M.R.C.V.S., stationed at Reading.

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R.C.V.S. OBITUARY

Harper, James Duncan, B.Sc. (Edin.), M.R.C.V.S., 12, Manna Grove, Castlereagh, Belfast. Graduated Edinburgh, December 12th, 1931. Died December 3rd, 1953; aged 44 years.

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MYXOMATOSIS IN RABBITS

In an announcement dated December 11th it is stated that the Myxomatosis Advisory Committee, at its meeting on December 10th, reviewed the steps taken in the past two months to contain the initial outbreaks of the disease in Kent and East Sussex, while all relevant factors were examined in relation to long-term policy. The announcement proceeds: "In the past two weeks there have been further outbreaks in South-East England, including East Suffolk and Essex, and a substantial outbreak in Kent. In the circumstances of these outbreaks and in the light of expert opinion on the Committee, the conclusion was reached that action such as was taken in regard to the initial outbreaks could no longer effectively influence the course of the disease. There are now more centres of infection and that at Lydd in Kent is extensive. Fencing of the new outbreaks is not practicable to prevent repopulation of the areas if they were cleared of rabbits. Although it was clear that action to contain and destroy rabbits in the infected areas by gassing and other means could no longer serve any practical and useful purpose as a method of stamping out the disease, the possibility remained that it would die out from natural causes before next spring, particularly if there is a hard winter. The Minister of Agriculture has accepted these conclusions of the Advisory Committee.

"The Committee reviewed the scientific evidence regarding the disease and is pressing on with its consideration of future policy."

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North Wales Division's Annual Dinner and Dance

The annual dinner and dance of the North Wales Division was held on December 4th, 1953, in the St. George's Hotel, Llandudno, and so popular has this function become that all the tickets for it were sold out a week beforehand. About 170 members and their friends attended. After the President (Mr. J. Richards) had taken wine with several groups of his guests under the direction of Mr. Michael, the toast-master, the toast of "The Veterinary Profession and the North Wales Division, B.V.A." was given by Sir William Jones, C.B.E., and replied to, in turn, by Professor Glover, President, R.C.V.S., and Mr. Alex Thomson, President, B.V.A. The toast of "The Guests," proposed by the Division's President, was responded to by Mr. J. N. Ritchie, C.V.O. of the Ministry.

Under the M.C.s, Messrs. Bowen and R. A. Richards, dancing followed the formal dinner and a number of beautiful prizes presented by drug firms were won by lucky dancers. During an interval in the dance the President called on Mr. Alex Thomson to present to Mr. Rowlands a token of the Division's appreciation of the good work he has done during the 10 years he has held office as Secretary.

Graphic Photos: Szalla Bros., 112, Mostyn Street, Llandudno.

Back row (left to right).—Mr. Alex Thomson, President, British Veterinary Association; Mr. J. N. Ritchie, Chief Veterinary Officer, Ministry of Agriculture; Professor Glover (Liverpool), President, Royal College of Veterinary Surgeons; Sir William Jones, C.B.E.

Seated.—Mr. J. Richards, President, North Wales Division, B.V.A.; Lady Jones.

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FAO CONFERENCE—FOOT-AND-MOUTH DISEASE CONTROL

The 70-nation conference of the United Nations Food and Agriculture Organisation (FAO) has come closer towards the establishment of a European commission for the control of foot-and-mouth disease, which has been under consideration since May last year. It has approved a resolution submitting a draft constitution of the projected body to FAO's European members for consideration and acceptance. The decision is subject to confirmation by the full FAO conference.

The European commission, with its seat in Rome, would operate on an annual budget of 50,000 dollars. FAO officials, pointing to the need for joint international measures, said: "The weakest control points in the fight against the disease have always been national frontiers."—*Reuter.*

A later message states that the text of a scheme to create a European commission for the control of foot-and-mouth disease was approved by a plenary session of the seventh conference of the Food and Agriculture Organisation in Rome. Only the delegates of France, Spain, Greece and Switzerland abstained from the vote.

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OPENING OF THE R.S.M. WELLCOME RESEARCH LIBRARY

Collaboration Essential to Meet Specialist Requirements

Opening the Wellcome Research Library at the Royal Society of Medicine recently, Lord Woolton said that the Government were much concerned that the findings and records of scientific achievement should be made as widely available as possible through the adequate service of technical libraries.

The office of the Lord President of the Council was considering ways of meeting the present specialist library requirements. In the field of medicine the Society were undoubtedly playing an outstanding part. If their library continued to grow, as it inevitably must, it would become an increasing strain on the Society's resources. It was already costing about £25,000 a year and it might be that before long

the Society would wish to consider some way of associating themselves with more general schemes for the supply of scientific literature and, by making their facilities more widely available, spreading the load which fell upon all branches of scientific endeavour.

The various interests in this field must collaborate if the public interests were to be met within the financial resources not only of the Society but of the country. Any vast project for a new national medical library was bound to be extravagantly and, he thought, impossibly expensive. It would involve a degree of unnecessary overlapping. In this field collaboration was better than competition and the Government would welcome an opportunity of discussing these problems when the Society considered the time was ripe.

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H.M. STATIONERY OFFICE PUBLICATIONS

The undermentioned have been published recently. Copies may be obtained, at the prices indicated, from the following H.M.S. Offices: York House, Kingsway, London, W.C.2; 423, Oxford Street, London, W.1; 13a, Castle Street, Edinburgh, 2; 39, King Street, Manchester, 2; 2, Edmund Street, Birmingham, 3; 1, St. Andrew's Crescent, Cardiff; Tower Lane, Bristol, 1; 80, Chichester Street, Belfast.

S.I. 1953:

Pharmacy

No. 1453: Dangerous Drugs Act, 1951 (Application), Order, September 30th, 1953. 2d. (3½d.) [Dangerous Drugs Act, 1951 s. 10(2)]

Traffic Signs

No. 1444: School Crossing Patrols Regulations, September 25th, 1953. 3d. (4½d.) [School Crossing Patrols Act, 1953 s. 2]

Vehicles

No. 1546: Road Vehicles Lighting (Reversing Lights) Regulations, October 22nd, 1953. 2d. (3½d.) [Road Transport Lighting Act, 1927 s. 3; Road Transport Lighting Act, 1953 s. 4(2)]

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BRITISH SHOW JUMPING ADVANCE

At the recently held annual meeting of the British Show Jumping Association Lieut.-Colonel C. L. T. Walwyn was re-elected President and Lieut.-Colonel M. P. Ansell re-elected Vice-President and Chairman. The latter intimated that membership had risen to the record number of more than 5,000—it was 500 in 1945—that there were 7,500 registered horses and ponies, and that 947 shows were affiliated to the Society.

Fourteen different riders and 31 horses competed in international events during the season, a sustained effort which has greatly increased popular interest and support. British show jumpers in England won £75,000 in prize money this year, compared with £48,000 in 1948.

In future the qualifications for a horse to be upgraded to grade A will be £150 won instead of £100 as hitherto. In addition, restricted grade C competitions are recommended for horses which have not yet won £50 in prize money. In future first prize money may not be divided by arrangement but only when ordered by the judge on the grounds of bad conditions, a programme running late, or when, as in the *puissance* at the White City, horses would have been overfaced by a further increase in the height of the jump.

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AMERICAN VETERINARIAN RECEIVES INTERNATIONAL POULTRY AWARD

The Poultry Association of Great Britain intimates an announcement by the Secretary (Mr. John R. Harvey, F.C.I.S.) of the Tom Newman International Award that the Award Committee in the United Kingdom has decided that the "1953" Award shall be made to Dr. Henry Van Roekel, D.V.M., PH.D., of the Department of Veterinary Science, University of Massachusetts, Amherst, Massachusetts, U.S.A.

The Award consists of a handsome medal and £50 sterling. It is given for what in the opinion of the Award Committee, meeting in London, is the most important contribution to poultry husbandry research work published, in the previous year, for the benefit of poultry husbandry.

The Award, instituted in 1948 by the Poultry Association of Great Britain, has been won on five occasions by U.S.A. research workers and once by a U.K. Research worker.

There are Corresponding Secretaries for the Award in every country where poultry husbandry is developed into an industry. The Corresponding Secretary for the U.S.A. is Dr. Morley A. Jull, of the University of Maryland.

Amongst the members of the Award Committee in the U.K. are Sir Thomas Dalling, M.A., F.R.C.V.S., Mr. E. T. Halnan, M.A. (of Cambridge), Mr. Michael Pease, M.A. (of Cambridge).

The work published in 1952 in which Dr. Van Roekel was concerned embraced:—

A report on pullorum disease eradication in Massachusetts.
A survey of the incidence of antigenic forms of *salmonella pullorum* in the U.S.A.
Chronic respiratory disease of chickens.
An egg-propagated immunising agent for the control of infectious bronchitis of chickens.
Cultural attributes of the chronic respiratory agent.

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BUCKS A.E.C. CONFERENCE ON ANIMAL HEALTH

A well-attended conference on animal health matters organised by the Buckinghamshire A.E.C. was held at the County Farm Offices, Stoke Mandeville, Aylesbury, on Thursday, November 19th. Mr T. M. Doyle opened the proceedings with a brief dissertation upon the preparation of and the value of swine fever crystal violet vaccine. He pointed out that whilst the serum-virus method widely adopted in America resulted in the deaths of a proportion of vaccinated animals since a live virus was being employed, the C.V. vaccine was completely non-virulent, the virus dying in the process of preparation. A batch of each vaccine was always retained against the day when a complaint was made, but no case of infection due to the use of the virus had yet been proved. Mr. Doyle pointed out the importance of ensuring that the pigs had not been exposed to swine fever during the previous fortnight, and were not exposed to infection for the two weeks following vaccination. He agreed that some outbreaks associated with vaccination might be due to the stimulation of already existing sub-chronic infection. There was as much infertility in non-vaccinated animals as in vaccinated animals. The vaccine gave adequate protection to breeding animals for a year, when re-vaccination should take place, and attention was drawn to the importance of selecting a proper site so that the material was not retained in the subcutaneous fat and be useless.

Mr. D. Wilson followed with an excellent paper on the eradication and control of mastitis due to *Str. agalactiae*. He emphasised the success now achieved with a *single* dose of penicillin in an oil-wax base and stressed the great importance of milking technique in the control of the infection. A point not generally realised was that an extensive programme of disinfection alone would not in itself produce appreciable benefits, and the speaker stressed the need to avoid udder injury by adopting short-time milking and by using the type of liner which would not create a severe back-pressure when the milk flow was falling and so damage the base of the teat.

The rapid method of drying-off when the milk yield had become uneconomic was favoured and the insertion of penicillin into cows at this stage was approved though the speaker showed little enthusiasm for the use of collodion.

After the tea interval Mr. Rowlands, V.I.O. for Bangor, discussed a number of sheep diseases and stressed the extreme importance of the environment in relation to these. He gave examples of the adaptation of breeds and flocks to certain localities and pointed out how "improved management" might upset the balance and cause disease, *e.g.*, pulpy kidney disease and parasitic infections.

Dr. Barron followed by giving a brief description of swayback and details of a survey which recently had been carried out in the county of Buckinghamshire. He said that the preliminary results did not give much support to the view that the change over from copper sulphate drenches to phenothiazine played a significant part in the increase in swayback observed recently.

N. S. B.

ADDRESSES OF DISEASE-INFECTED PREMISES

The list given below indicates, first, the county in which are situated the premises on which disease has been confirmed, followed by the postal address and date of outbreak.

ANTHRAX:

Anglesey.—Barons Hill Home Farm, Beaumaris (Dec. 9).
Bucks.—Holding "B," Redfields, Horwood Road, Winslow, Bletchley (Dec. 12).
Kirkcudbrightshire.—Newmains, Kirkbean (Dec. 11).
Pembroke.—Pentreglas Farm, Hebron, Carmarthen (Dec. 10).
Somerset.—Moors Farm, Berkley, Frome (Dec. 8).

FOOT-AND-MOUTH DISEASE:

Glam.—Troedrhiwfuch Farm, Troedrhiwfuch, Bargoed (Dec. 12); Rhiwbina Farm, Rhiwbina, Cardiff (Dec. 14).

FOWL PEST:

Bucks.—13, Church Street, Wingrave, Aylesbury (Dec. 12).
Ches.—Windover, Mountlake Crescent, Sandy Lane, Chester (Dec. 12).
Cumberland.—John Hopes Allotments, Borothorn, Cleaton Moor (Dec. 13).
Essex.—Nettlebed Poultry Farm, Downham, Billericay; Neupers Cottage, Tysea Hill, Stapleford Abbot, Romford (Dec. 9); King Street Farm, High Ongar, Ongar (Dec. 10); 71, Bell Common, Epping; Charnell, 181, Ipswich Road, Colchester; Caton Poultry Farm, Blakemore, Ingatestone (Dec. 11); Foxborough Farm, Stock, Ingatestone (Dec. 12); Meadowside, Joes Lane, Downham, Billericay (Dec. 13).
Isle of Ely.—46 and 96, Bridge Street, Chatteris (Dec. 9); The Yews, Parson Drove, Wisbech (Dec. 12).
Lancs.—New Laithe Farm, Winewall, Colne (Dec. 9); 42, North Row, Roose, Barrow-in-Furness (Dec. 11).
Leics.—Belvoir Poultry Packers, Stathern, Melton Mowbray (Dec. 9).
Lincs.—The Chestnuts, Billingboro, Sleaford (Dec. 13).
London.—282, Lynton Road, Bermondsey, S.E.1 (Dec. 9).
Middsx.—Dexholme Farm, Ashgrove Road, Ashford (Dec. 13).
Norfolk.—Paper Street, Yaxham, Dereham (Dec. 9); White House, Clint Green, Yaxham; Walnut Tree House, Mottishall, East Dereham (Dec. 10); Mill Farm, North Tuddenham, East Dereham (Dec. 11); Lansdale Villa, Town Street, Upwell, Wisbech (Dec. 12).
Notts.—7, Hillside Cottages, Burton Joyne, Nottingham, The Elms, Granby, Nottingham (Dec. 11).
Yorks.—Glen View, Wheatley, Halifax (Dec. 10).

SWINE FEVER:

Denbighs.—Poplar Place, Adway Coedpoeth, Nr. Wrexham (Dec. 9).
Essex.—Fen Farm, Elmstead, Colchester; Red Rose Farm, Blackmore, Ingatestone (Dec. 10); Lock's Hill Field, South Street, Rochford (Dec. 11); Lock's Hill Field, South Street, Rochford (Dec. 11).
Kent.—East Haxted Farm, Haxted (Dec. 11).
Lancs.—Waring's Farm, Back Lane, Heath Charnock, Chorley (Dec. 9); Fishbarn Farm, Heath Charnock, Chorley (Dec. 10).
Lincs.—Richmond Drive Piggeries, Skegness (Dec. 9); Ives Farm, Blackbush, Whittlesey; Holmlea, Knight Street, Pinchbeck, Spalding (Dec. 11); Holmlea, Knight Street, Pinchbeck, Spalding (Dec. 11).
Middx.—420, Oakleigh Road, N.20 (Dec. 9).
Monmouth.—Highdene, Gavilan, Abergavenny (Dec. 9).
Montgomeryshire.—Little Rhynsant, Four Crosses, Llanymynech (Dec. 9).
Northants.—Ives Farm, Blackbush, Whittlesey, Peterborough (Dec. 11).
Perths.—The Hotel, Abernethy (Dec. 10).
Salop.—Mount Pleasant, Clun, Craven Arms (Dec. 9).
Surrey.—56, Woodlands Avenue, Epsom (Dec. 11); East Haxted Farm, Haxted, near Edenbridge; 56, Woodlands Avenue, Epsom (Dec. 11).
Sussex.—Lee Place Farm, Pulborough (Dec. 10); Keeper's Farm, Copthorne, Crawley (Dec. 12).

CORRESPONDENCE

The views expressed in letters addressed to the Editor represent the personal opinions of the writer only and their publication does not imply endorsement by the B.V.A.

TRIBUTE TO PROFESSOR BROWNE

Sir,—Many members of the veterinary profession have expressed a desire to pay a suitable tribute to Professor Browne for his long service to the profession.

The Veterinary Medical Association of Ireland feels that members of the profession and past graduates of the Dublin Veterinary College will be glad of this opportunity to associate themselves with a presentation which has been decided upon by the Council. In a fund which is being opened for this purpose the subscription is limited to 10s., which should be forwarded to the Hon. Treasurer, Veterinary Medical Association of Ireland, Veterinary College, Ballsbridge, Dublin, not later than January 22nd, 1954, so that the presentation may be made at the Annual General Meeting to be held in the Shelbourne Hotel at 7.30 p.m. on Friday, January 29th, 1954.

It is felt that many Dublin graduates now resident in Great Britain would be anxious to have the opportunity of participating in this presentation.—Yours faithfully, P. E. MULLANEY, *Hon. Secretary*, The Veterinary Medical Association of Ireland, Veterinary College, Ballsbridge, Dublin, Ireland. *December 9th*, 1953.

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THE ANNUAL CONGRESS

Sir,—Now that the B.V.A. Congress is well past and some of us, at least, are looking forward to next year's event, may I, through the courtesy of these columns, enquire what is the *official* attitude to the annual Congress?

I believe that the question needs an answer, although I am not at all heartened by the knowledge that previous attempts to have this question discussed have met with little success.

Even allowing for the many difficulties involved in attending a Congress, are we quite satisfied that our annual gathering is symptomatic of a live and active profession?

The first point which needs an answer is a clear definition of our reasons for holding a Congress. Is it intended to be predominantly a social gathering (a description placed on it with startling vehemence by some members of recent provisional committees)? If that be so, we can well understand that during daylight hours a period should be set aside for at least partial somnolence in readiness for the next evening's "high jinks." To ensure completely satisfactory conditions for these periods of restful inactivity we would make a plea for more comfortable furniture to hold our weary and trembling bodies. We could very well do without the succession of individuals on the platform who will insist on talking at us and flashing lights on and off to show us pretty pictures. Let us also ban the traditional British method of showing appreciation—applause is a violent method of restoring the hibernator to a fuller possession of his normal faculties.

If, on the other hand, it is faintly possible that we would prefer to dilute the social round with some sort of pretence at scientific interest, are we willing to work a great deal harder to produce a first-rate effect?

"Recent Advances at Weybridge" is an intensely interesting type of paper, but no single institution or even a particular branch of science advances at a pace which will produce an interesting paper every year. A discussion on the newer drugs and instruments is bound to attract the practical man, but it must be more critical than this year's effort, which in my opinion sounded like a succession of manufacturer's packing leaflets read aloud.

In my experience, practical demonstrations—even something more approaching joinery than surgery, as we saw at Eastbourne—are invariably successful, but the arena must be well laid out since there is nothing quite so disheartening as a close-up of a colleague's hirsute auricular appendages. We must *all* be able to see everything in comfort without volvulus-producing acrobatics. For instance, is closed circuit television really the prerogative of the American Veterinary Medical Association? Would the pro-

fession (and the manufacturers of the equipment) be unwilling to enjoy the publicity value of such a venture?

The session of short papers on a variety of subjects has a definite appeal. There is usually something of interest some time, for somebody, in such a conglomeration. This type of symposium has the added advantage of bringing out the new and less experienced speaker capable of sustaining interest for a short period but as yet unwilling or unable to launch an erudite treatise.

An analysis of the annual attendance suggests that around 350 people (including visitors and official delegates) are able to be present, but it is quite obvious that a considerable proportion of that number will be the "hardy annuals." Excluding delegates and visitors, the total number of veterinarians in attendance is about 200, and of these at least 40 are office-bearers and members of Council of the B.V.A. and would in any case presumably feel it their duty to be there to attend the business meetings.

I believe that we must seriously turn our attention to the younger members of the profession and actively attempt to get them to come to a Congress.

The main stumbling block is surely the expense, particularly of accommodation. This might be overcome by combining the Congress with the annual holiday. For those who claim that they do not mix business with pleasure, please note that for two or three happy couples attendance at this year's B.V.A. Congress and the "International" in Stockholm was combined with an event of no less importance than a honeymoon.

The Society of Chemical Industry recently demonstrated their awareness of the attendance problem by holding their annual conference in Nottingham, where cheap accommodation for those not requiring hotel rooms was made available in the university hostels—there are, of course, many other congresses doing the same. The fact that such institutions do not usually contain double bedrooms was a cause of mild consternation to the happily married, but I am told that the practical problems were satisfactorily resolved.

The cost of the various Congress functions is very small and very well worth the outlay; in any case, however, attendance is not compulsory.

The remaining difficulty is to obtain leave from work to attend. In this connection is it utterly inconceivable that a skeleton Congress programme consisting of the titles of the papers to be given and/or the names of speakers could not be made available in March or April, so that an opportunity be given to make holiday plans well in advance?

A particularly astute publicity agent from the Congress town or city could possibly arm himself with a list of members of the B.V.A. and send out his holiday brochures. The result?—possibly a well-attended Congress truly representative of our profession.

What is it to be at Torquay, where there are institutions within reasonable distance likely to be able to assist with cheap accommodation—a Congress or a soirée?—Yours faithfully, N. M. Black, Nottingham.

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R.C.V.S. ANNUAL FEES

Sir,—I have read with interest Mr. Fox's letter on the above subject. There is an old saying that "even a worm will turn." Not that I wish to imply that Mr. Fox belongs to that category. Rather the opposite. It is pleasing to note that there is at least one member of the profession who does not "take everything lying down."

I, too, received a circular letter from the Registrar concerning fees. Fortunately, living in Cape Town I "get off" with one guinea, which, since we were deprived of our rights and privileges, I consider is heavy enough.

But I hate injustice and it seems to me unfair that the general practitioner, who for years studied the Science and Art of Veterinary Surgery and Medicine and spent hundreds of pounds of his own or his father's money in the process, should have to pay four guineas a year whereas his rival, the registered practitioner, who maybe has had no scientific education and has never passed an examination in his life should only be called upon to pay one guinea per annum.

I am glad to think there is at least one member of the profession who is prepared to give our exalted confrères at Red Lion Square a "bit of a shake up."—Yours faithfully, L. E. W. Bevan, 22, Camp Road, Pinelands, Cape Town. *November 15th*, 1953.

THE VETERINARY ASSISTANT PROBLEM

Sir,—I am a veterinary surgeon employed in the practice of A. V. B. Foster and wish to rectify any erroneous inferences, which may have been drawn from his letter in this publication on November 21st.

Mr. Foster is wholly concerned with and greatly distressed over the immediate "call up" of recent graduates. This procedure is naturally creating an ideal opening for the veterinary surgeon who, after several years in practice, has failed to establish himself through obvious reasons, and the newly qualified man, who should fill such vacancies, is also being deprived of essential clinical experience, which it is impossible to obtain from any veterinary school.

In consequence many veterinary surgeons, Mr. Foster being one, are very much overworked owing to the scarcity of suitable assistants.—Yours faithfully, J. S. Heath, 22, Bibury Road, Hall Green, Birmingham, 28. *December 14th*, 1953.

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ESSEX VETERINARY SOCIETY—AN APOLOGY

Sir,—May I, through your columns, apologise to all members of the Essex Veterinary Society to whom cancellation of the meeting on December 10th caused any inconvenience? At 4 p.m. on December 10th the fog in the Chelmsford area appeared to be thickening considerably and the President and myself, after consultation with the speaker, Mr. Rowson, decided to cancel the meeting.

It is hoped to reorganise Mr. Rowson's meeting some time in January and I will inform all members of the date.—Yours faithfully, Roger Massey, *Secretary*, Essex Veterinary Society, 11, Widford Road, Chelmsford, Essex. *December 11th*, 1953.

PS.—I would add that after this momentous decision had been taken the fog cleared away!

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A BROADCAST "EXCELLENTLY DONE"

Sir,—May I pay a tribute to the wireless broadcast "I want to be a Veterinary Surgeon" on the Home Service of the B.B.C.? My husband and I both listened in and were very much impressed and thought it most excellently done. The producer deserves great credit for bringing in so much matter in such a short time. I think every side of the profession was touched upon and I feel all who took part are to be congratulated.

Though a member of the sister profession, medicine, I felt very proud to be allied to the veterinary profession and I feel that broadcasts such as that we heard are an incentive to present and prospective members of the profession to go forward and maintain their high ideals of work and service.—Yours faithfully, Helen L. Mitchell, 141, Mayfield Road, Edinburgh, 9. *December 12th*, 1953.

Summary of Returns of Confirmed Outbreaks of Scheduled (Notifiable) Diseases

Period	Anthrax	Foot-and-mouth	Fowl Pest	Sheep Scab	Swine Fever
16th to 30th November, 1953 ...	24	1	37	—	69
Corresponding period in—1952	90	—	24	—	24
1951	13	37	69	2	61
1950	12	—	9	1	53
1st January to 30th November, 1953	569	35	862	—	2,578
Corresponding period in—1952	1,051	495	230	1	788
1951	367	70	784	8	1,257
1950	318	20	120	24	330

Tuberculosis (Attested Herds) Schemes

The number of Attested Herds, i.e., herds officially certified as free from Tuberculosis as at November 30th, 1953, was as follows:

England	Wales	Scotland	Total (Great Britain)
53,686	28,957	28,008	110,651